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IS 4695-1 (2003): General Purpose Knuckle Threads, Part 1:
Profile and Nominal Sizes [PGD 20: Engineering Standards]

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भाग 1 प्रोफाइल एवं नामिनल साइज
(दूसरा पुनरीक्षण)

Indian Standard

GENERAL PURPOSE KNUCKLE THREADS

PART 1 PROFILE AND NOMINAL SIZES
(Second Revision)

ICS 21.040.10

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BUREAU OF INDIAN STANDARDS
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FOREWORD

This Indian Standard (Part 1) (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Engineering Standards Sectional Committee had been approved by the Basic and Production Engineering Division Council.

This standard was first published in 1968 and subsequently revised in 1988. This second revision has been taken up for updating this standard incorporating the developments taken place in the field at international level.

In the preparation of this standard assistance has been derived from DIN 405-1997 'General purposes knuckle threads — Part 1 : Profile and nominal sizes' issued by the Deutsches Institut für Normung (DIN).

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard
GENERAL PURPOSE KNUCKLE THREADS
PART 1 PROFILE AND NOMINAL SIZES
(Second Revision)

1 SCOPE

This standard covers the symbol, terminology, design profile and dimensions of the knuckle threads, in the size range of 8 mm to 200 mm.

2 SYMBOLS AND TERMINOLOGY

For the purpose of this standard, the symbols and terminology as given below in Table 1 shall apply.

Table 1 Symbols and Terminology
(Clause 2)

Sl No. (1)	Symbol (2)	Description (3)
(i)	a_c	Crest clearance
(ii)	d	Major diameter of external thread
(iii)	d_2	Pitch diameter of external thread
(iv)	d_3	Minor diameter of external thread
(v)	D_1	Minor diameter of internal thread
(vi)	D_2	Pitch diameter of internal thread
(vii)	D_4	Major diameter of internal thread
(viii)	es	Fundamental deviation of external thread (upper deviation)
(ix)	P	Lead of single start thread and pitch of multi-start thread
(x)	P_h	Lead of multi-start thread
(xi)	H	Height of fundamental triangle
(xii)	$h_3 = H_4$	Height of threads
(xiii)	H_1	Flank overlapping
(xiv)	R_1	Crest radius or root radius of external thread
(xv)	R_2	Crest radius of internal thread
(xvi)	R_3	Root radius of internal thread
(xvii)	n	Number of threads

3 DESIGN PROFILES

3.1 External and internal knuckle threads as specified in this standard do not have the same design profile. External threads have the same radii at the crest and at the root, while internal threads have different radii. The major, pitch and minor diameters are based on the design profile (see Fig. 1).

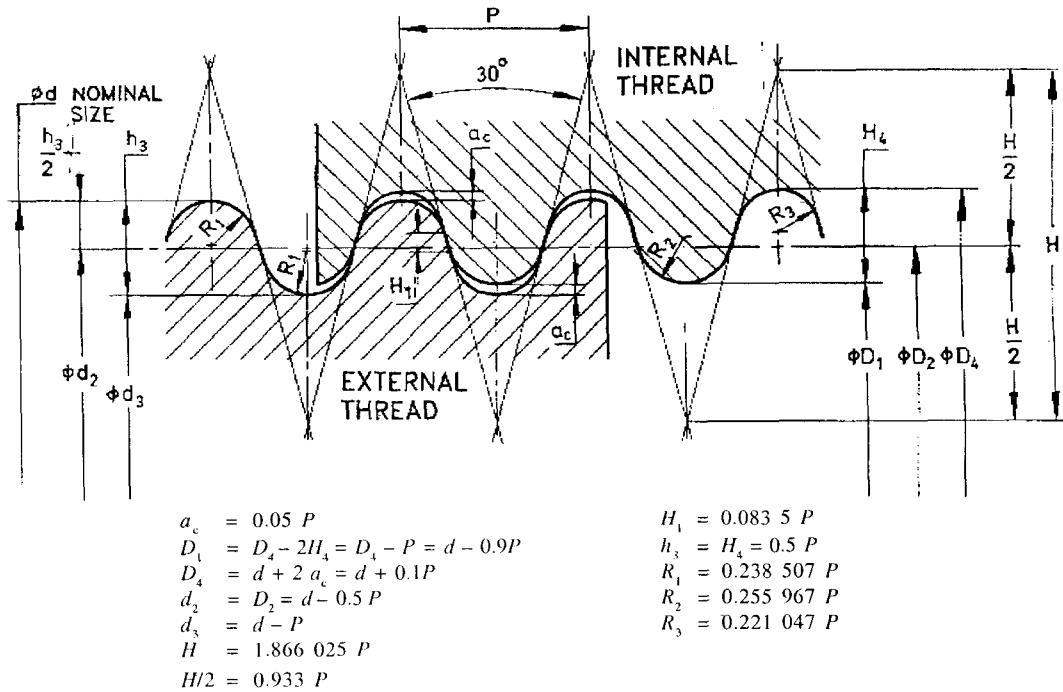


FIG. 1 DESIGN PROFILES FOR EXTERNAL AND INTERNAL THREADS
(WITH CREST CLEARANCE, BUT WITHOUT FUNDAMENTAL DEVIATION) (NUTATION)

3.2 Dimensions for the design profile shall be as given in Table 2 when read with Fig. 1.

Table 2 Design Profile
(Clause 3.2)

All dimensions in millimetres.

<i>P</i> Symbol		Number of Threads per 25.4 mm	a_c	<i>H</i>	$h = H_4$	H_1	R_1	R_2	R_3
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1/10	2.540	10	0.127	4.740	1.270	0.212	0.606	0.650	0.561
1/8	3.175	8	0.159	5.925	1.588	0.265	0.757	0.813	0.702
1/6	4.233	6	0.212	7.899	2.117	0.353	1.010	1.084	0.936
1/4	6.350	4	0.317	11.849	3.175	0.530	1.515	1.625	1.404

4 DESIGN PROFILES FOR THREADS WITH FUNDAMENTAL DEVIATION

Design profiles for threads with fundamental deviation are shown in Fig. 2 and Fig. 3.

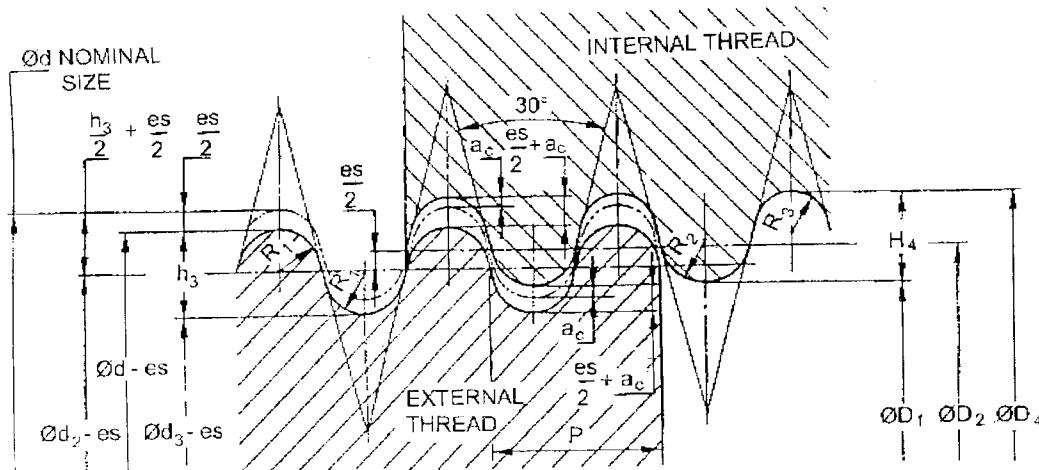


FIG. 2 PROFILES FOR EXTERNAL AND INTERNAL THREADS
(WITH FUNDAMENTAL DEVIATION es AND CREST CLEARANCE a_c)

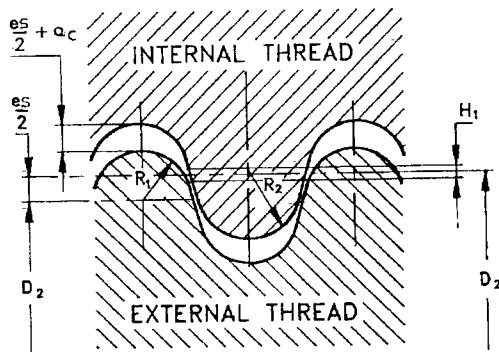
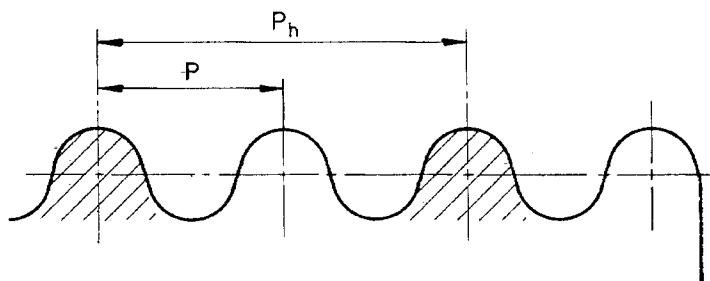


FIG. 3 FLANK OVERLAPPING (NOTATION)

5 PROFILES FOR MULTI-START THREADS

Multi-start threads have the same profile as single-start threads if the pitch of the former is equal to the lead of the latter. The pitch, P , of multi-start threads shall be selected from the values specified in Table 3 for the lead of single-start threads. The lead, P_h , of multi-start threads shall be determined by multiplying the pitch by the number of threads (that is $P_h = P \times n$), where by P_h does not have to be equal to one of the value given for P in Table 3.



P_h — lead (axial displacement for one turn).

P — pitch (axial distance between two adjacent equi-directional flanks).

FIG. 4 PROFILE FOR DOUBLE — START THREADS

6 DESIGNATION

6.1 Single-start knuckle threads in conformity with this standard shall be designated by the letters R_d followed by the nominal thread diameter and the lead P of the single-start thread (in this case, lead P equals to pitch P) separated by the sign X.

Example

$R_d\ 40\ X\ 4.233$

6.2 Multi-start knuckle threads in conformity with this standard shall be designated by the letters R_d followed by the nominal thread diameter and the lead P_h of the multi-start thread, the letter P (pitch) and the pitch separated by the sign X.

Example

$R_d\ 40\ X\ 8.466\ P\ 4.233$

$$\text{In the example, number of threads} = \frac{\text{Lead, } P_h}{\text{Pitch, } P} = \frac{8.466}{4.233}$$

It follows that it is a double-start thread.

7 DIMENSIONS

The nominal thread dimensions for the knuckle screw threads are given in Table 3.

Table 3 Dimensions for Knuckle Screw Threads

(Clauses 5 and 7)

All dimensions in millimetres.

Nominal Thread Diameter <i>d</i>		Number of Threads per 25.4 mm (3)	Lead (or Pitch) (4)	Pitch Diameter $d = D_{\frac{2}{3}}$ (5)	Major Diameter <i>D</i> ₄ (6)	Minor Diameters	
Series 1 (1)	Series 2 (2)					<i>d</i> ₃ (7)	<i>D</i> ₁ (8)
8		10	2.54	6.73	8.254	5.46	5.714
9		10	2.54	7.73	9.254	6.46	6.714
10		10	2.54	8.73	10.254	7.46	7.714
11		10	2.54	9.73	11.254	8.46	8.714
12		10	2.54	10.73	12.254	9.46	9.714
14		8	3.175	12.412	14.318	10.825	11.142
16		8	3.175	14.412	16.318	12.825	13.142
18		8	3.175	16.412	18.318	14.825	15.142
20		8	3.175	18.412	20.318	16.825	17.142
22		8	3.175	20.412	22.318	18.825	19.142
24		8	3.175	22.412	24.318	20.825	21.142
26		8	3.175	24.412	26.318	22.825	23.142
28		8	3.175	26.412	28.318	24.825	25.142
30		8	3.175	28.412	30.318	26.825	27.142
32		8	3.175	30.412	32.318	28.825	29.142
36	34	8	3.175	32.412	34.318	30.825	31.142
		8	3.175	34.412	36.318	32.825	33.142
	38	8	3.175	36.412	38.318	34.825	35.142
40	42	6	4.233	37.883	40.423	35.767	36.19
44		6	4.233	39.883	42.423	37.767	38.19
		6	4.233	41.883	44.423	39.767	40.19
48	46	6	4.233	43.883	46.423	41.767	42.19
		6	4.233	45.883	48.423	43.767	44.19
	50	6	4.233	47.883	50.423	45.767	46.19
52		6	4.233	49.883	52.423	47.767	48.19
55	58	6	4.233	52.883	55.423	50.767	51.19
		6	4.233	55.883	58.423	53.767	54.19
60	62	6	4.233	57.883	60.423	55.767	56.19
		6	4.233	59.883	62.423	57.767	58.19
65		6	4.233	62.883	65.423	60.767	61.19
70	68	6	4.233	65.883	68.423	63.767	64.19
		6	4.233	67.883	70.423	65.767	66.19
	72	6	4.233	69.883	72.423	67.767	68.19
75	78	6	4.233	72.883	75.423	70.767	71.19
		6	4.233	75.883	78.423	73.767	74.19
80		6	4.233	77.883	80.423	75.767	76.19

Table 3 — Concluded

Nominal Thread Diameter d		Number of Threads per 25.4 mm (3)	Lead (or Pitch) (4)	Pitch Diameter $d = D_2 - D_3$ (5)	Major Diameter D_4 (6)	Minor Diameters	
Series 1 (1)	Series 2 (2)					d_3 (7)	D_1 (8)
85	82	6	4.233	79.883	82.423	77.767	78.19
		6	4.233	82.883	85.423	80.767	81.19
	88	6	4.233	85.883	88.423	83.767	84.19
90	92	6	4.233	87.883	90.423	85.767	86.19
		6	4.233	89.883	92.423	87.767	88.19
	95	6	4.233	92.883	95.423	90.767	91.19
100	98	6	4.233	95.883	98.423	93.767	94.19
	105	6	4.233	97.883	100.423	95.767	96.19
		4	6.35	101.825	105.635	98.650	99.285
110	115	4	6.35	106.825	110.635	103.650	104.285
		4	6.35	111.825	115.635	108.650	109.285
	120	4	6.35	116.825	120.635	113.650	114.285
130	125	4	6.35	121.825	125.635	118.650	119.285
	135	4	6.35	126.825	130.635	123.650	124.285
		4	6.35	131.825	135.635	128.650	129.285
140	145	4	6.35	136.825	140.635	133.650	134.285
		4	6.35	141.825	145.635	138.650	139.285
	150	4	6.35	146.825	150.635	143.650	144.285
160	155	4	6.35	151.825	155.635	148.650	149.285
	165	4	6.35	156.825	160.635	153.650	154.285
		4	6.35	161.825	165.635	158.650	159.285
170	175	4	6.35	166.825	170.635	163.650	164.285
		4	6.35	171.825	175.635	168.650	169.285
	180	4	6.35	176.825	180.635	173.650	174.285
190	185	4	6.35	181.825	185.635	178.650	179.285
	195	4	6.35	186.825	190.635	183.650	184.285
		4	6.35	191.825	195.635	188.650	189.285
200		4	6.35	196.825	200.635	193.650	194.285

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Amendments Issued Since Publication

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